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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,468	11/14/2003	Daniel G. Knierim	7054-US1	9147
7590 05/06/2005			EXAMINER	
Thomas F. Lenihan			NGUYEN, HAI L	
TEKTRONIX, INC.			ART UNIT	
P.O. Box 500, M/S 50-LAW			PAPER NUMBER	
Beaverton, OR 97077-0001			2816	

DATE MAILED: 05/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/713,468

Applicant(s)

KNIERIM ET AL.

Examiner

Hai L. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/14/ 2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
2. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because words and labels are unreadable. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Objections

3. Claim 4 is objected to because of the following informalities: "the reference signal frequency" should be changed to --the first frequency-- as recited in lines 2-3 of claim 1. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 4-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 4 is indefinite because the limitation “a feedback circuit comprising at least said first accumulator and said second accumulator for feeding back an accumulated error to the first accumulator for providing a next value in said sequence of divide ratios” is misdescriptive. It is misdescriptive because Fig. 3 clearly shows that the feedback circuit is only part of the Sigma-Delta Modulator (280) that comprises first (350), second (340), and third (370) accumulators; and the feedback circuit (355, 357, 370, 395) for feeding back an accumulated error (output of 357) to the first accumulator (see page 8, lines 27-29). Therefore, the feedback circuit does not comprise either the first accumulator or the second accumulator.

Claim 19 is similar rejected; note the above discussion with regard to claim 4.

- Claims 5-18 and 20-26 are rejected due to their dependencies on the base claims 4 and 19.

7. Claim 27 is indefinite for the same reason as “a claim directed to an automatic transmission workstand and the method steps of using it” was held to be ambiguous by the Board of Appeals. See *Ex parte Lyell*, 17 USPQ2d 1548 (Bd. Pat. App. & Inter. 1990) and M.P.E.P. 2173.05(p).

Claim Rejections - 35 USC § 101

8. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 27 is rejected under 35 U.S.C. 101, as being directed to neither an "apparatus" nor a "method", but rather embraces or overlaps two different statutory classes of invention set forth in 35 U.S.C. 101.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-10, 12-14, and 19-22, to the extent understood, are rejected under 35 U.S.C. 102(e) as being anticipated by Lee (US 6,844,836).

With regard to claims 1 and 4, Lee discloses in Figs. 1-2 a phase-locked loop-type frequency synthesizer, and a method of use thereof, comprising a reference signal source for providing a reference signal (fref); a programmable oscillator for providing an oscillating signal (fvco); a programmable pre-scaler (102-108) for dividing the oscillating signal from the programmable oscillator according to a sequence of divide ratios to produce a divided signal having a frequency approximating the reference signal frequency; a phase comparator (112); and

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a modulator (118) for providing the sequence of divide ratios wherein a next value in the sequence of divide ratios is provided by accumulating an error between a present value in the sequence of divide ratios and an average value of the sequence of divide ratios, accumulating the accumulated errors, and selecting the next value in the sequence of divide ratios such that the multiply-accumulated error values are maintained within finite bounds, wherein the modulator comprises a first accumulator (202) for accumulating an error between a present value in the sequence of divide ratios and an average value of the sequence of divide ratios; a second accumulator (204) for accumulating an error output of the first accumulator; and a feedback circuit (212s, 218, 220).

With regard to claim 2, further comprising a step of filtering (LPF) a control signal to remove high-frequency phase noise prior to using the control signal for adapting the first frequency to reduce a phase difference between the divided signal and the reference signal.

With regard to claims 3 and 5-7, the reference also meets the recited limitations in these claims.

With regard to claim 8, the programmable oscillator comprises a voltage controlled oscillator (see the abstract).

With regard to claim 9, the synthesizer further comprises a filter (LPF) for filtering the control signal to remove high-frequency phase noise prior to adapting the programmable oscillator (not shown).

With regard to claim 10 and 12-14, the reference also meets the recited limitations in these claims.

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With regard to claim 19, Lee discloses in Fig. 19 a modulator (118) for producing an integer sequence with an average value of N/M , wherein N and M are integers, comprising a first accumulator (202) for accumulating an error between the integer sequence and the average value; a second accumulator (204) for accumulating an error output of the first accumulator; and a feedback circuit (212s, 218, 220).

With regard to claims 20-22, the reference also meets the recited limitations in these claims.

Allowable Subject Matter

11. Claims 11, 15-18, and 23-26 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The prior art of record fails to disclose or fairly suggest a phase-locked loop-type frequency synthesizer, as recited in claim 11, having specific structural limitations such as a summing circuit (250 in instant Fig. 2) interposed between the modulator output (x) and an input to the pre-scaler (275) for offsetting the sequence of divide ratios determined by the modulator (280), such that the sequence of divide ratios may contain values beyond those which may be represented in the modulator, and being configured in combination with the rest of the limitations of the base claims and any intervening claims.

The prior art of record fails to disclose or fairly suggest a phase-locked loop-type frequency synthesizer, as recited in claims 15 and 23, having specific structural limitations such as the accumulators (350, 340, 330 in instant Fig. 3) of the modulator (280) comprise carry

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chains (355, 357), wherein the minimum clock period is limited by the time for the summing circuits carry chains to propagate up the full width of the data busses, followed by the propagation delay of the divider and multiplier, followed by another carry chain propagation, as the multiply operation can cause a Least-significant Bit to change after a transition in the value of X (see page 11, lines 8-12), and being configured in combination with the rest of the limitations of the base claims and any intervening claims.

The prior art of record fails to disclose or fairly suggest a phase-locked loop-type frequency synthesizer, as recited in claims 17 and 25, having specific structural limitations such as the feedback circuit (355, 357, 370, 395) further comprises at least one summing circuit (355) and a numeric divider circuit (370) adapted to determine a next value in the sequence of divide ratios needed to maintain the accumulators finite and without overflow, and being configured in combination with the rest of the limitations of the base claims and any intervening claims.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Keaveney et al. (US 6,556,086) is cited as of interest because it discloses a fractional-N synthesizer and method of synchronization of the output phase.


13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai L. Nguyen whose telephone number is 571-272-1747 and Right Fax number is 571-273-1747. The examiner can normally be reached on Monday-Thursday.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Callahan can be reached on 571-272-1740. The official fax phone number for the organization where this application or proceeding is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1562.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HLN 
April 25, 2005


TIMOTHY P. CALLAHAN
SUPERVISORY PATENT EXAMINER
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